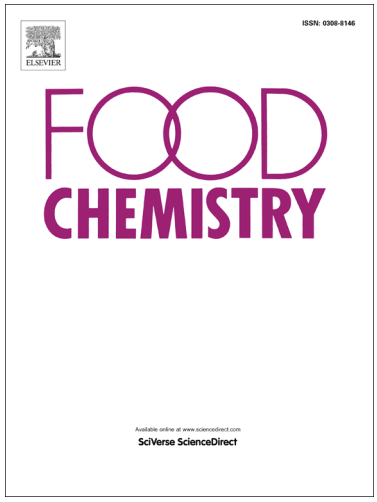

Freeze-dried phosphatidylcholine liposomes encapsulating various antioxidant extracts from natural waste as functional ingredients in surimi gels

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Freeze-dried phosphatidylcholine liposomes encapsulating various antioxidant extracts from natural waste as functional ingredients in surimi gels

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Abstract

Three antioxidant extracts (collagen hydrolysate, pomegranate peel extract, shrimp lipid extract) were encapsulated in soy phosphatidylcholine liposomes with the addition of glycerol. The particle size of the fresh liposomes ranged from 75.7 to 81.0 nm and zeta potential from –64.6 to –88.2 mV. Freeze-drying increased particle size (199–283 nm), and slightly decreased zeta potential. The lyophilized liposomes were incorporated in squid surimi gels at 10.5 % concentration. An alternative functional formulation was also prepared by adding 2 % of non-encapsulated bioactive extract. The gels were characterized in terms of colour, texture and oxidative stability (TBARS) after processing and also after frozen storage. The incorporation of the freeze-dried liposomes caused a slight decrease in gel strength and contributed to maintaining the stability of the gels during long-term frozen storage. The antioxidant properties of the bioactive extracts, liposomes and *in vitro* digested surimi gels were determined.

Keywords: soy phosphatidylcholine, liposomes, freeze-drying, antioxidants, surimi gels, storage.